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Position Location and Navigation Symposium, IEEE 2000 , 2000

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drilling and bit

**Search Again****Results:**Journal or Magazine = **JNL** Conference = **CNF** Standard = **STD****1 Real time monitoring of tool wear using multiple modeling meth d***Ertunc, H.M.; Loparo, K.A.; Ozdemir, E.; Ocak, H.*Electric Machines and Drives Conference, 2000. IEMDC 2001. IEEE Internation  
Page(s): 687 -691[\[Abstract\]](#) [\[PDF Full-Text \(400 KB\)\]](#) **CNF****2 Petrophysics of magnetic dipole fields in an anisotropic earth***Howard, A.Q., Jr.*Antennas and Propagation, IEEE Transactions on , Volume: 48 Issue: 9 , Sept  
Page(s): 1376 -1383[\[Abstract\]](#) [\[PDF Full-Text \(252 KB\)\]](#) **JNL****3 Investigation on electromagnetic measurement ahead of drill-bit***Qiang Zhou; Gregory, D.; Siyuan Chen; Chew, W.C.*Geoscience and Remote Sensing Symposium, 2000. Proceedings. IGARSS 200  
2000 International , Volume: 4 , 2000  
Page(s): 1745 -1747 vol.4[\[Abstract\]](#) [\[PDF Full-Text \(232 KB\)\]](#) **CNF****4 Testing the applicability of fiber optic gyroscopes f r azimuth monit  
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**5 On-line reliability estimation of individual components, using degraded signals**

*Chinnam, R.B.*

Reliability, IEEE Transactions on , Volume: 48 Issue: 4 , Dec. 1999

Page(s): 403 -412

[\[Abstract\]](#) [\[PDF Full-Text \(528 KB\)\]](#) **JNL**

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**6 Remote control seafloor coring in the west Mariana basin**

*McGinnis, T.*

OCEANS '99 MTS/IEEE. Riding the Crest into the 21st Century , Volume: 1 , 1

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**7 Fun and games and microcomputer interfacing (laboratory exercises**

*Fulcher, J.A.*

IEEE Micro , Volume: 11 Issue: 1 , Feb. 1991

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**8 A control system for optimizing deep hole drilling conditions**

*Hancke, G.P.; van Harmelen, G.L.; Vermeulen, C.*

Industrial Electronics, Control and Instrumentation, 1991. Proceedings. IECON 1991 International Conference on , 1991

Page(s): 2279 -2284 vol.3

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**9 The effective control of a deep hole diamond drill**

*Hancke, G.P.*

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[\[Abstract\]](#) [\[PDF Full-Text \(324 KB\)\]](#) **CNF**

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**10 A smart algorithm for improving entry stability**

*Howie, W.L.; Frizzell, E.M.*

Industry Applications Society Annual Meeting, 1989., Conference Record of the  
IEEE, 1989  
Page(s): 1556 -1564 vol.2

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Page(s): 2148 -2153 vol.4[\[Abstract\]](#) [\[PDF Full-Text \(324 KB\)\]](#) **CNF****2 Experimental study of the conversion of DC electric fields to microwave radiation by an ionization front created by successive discharges***Faith, J.; Huang, J.; Kuo, S.P.*

Plasma Science, 1995. IEEE Conference Record - Abstracts., 1995 IEEE International Conference on , 1995

Page(s): 138

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L2 300 S L1 AND ROLLER CONE BIT?  
L3 215 S L2 AND EARTH  
L4 8 S L3 AND CRATER  
L5 186 S L3 AND HOLE  
L6 12 S L5 AND BOTTOMHOLE  
L7 30 S L2 AND SIMULAT?  
L8 21 S L7 AND EARTH  
L9 17 S L8 AND HOLE

=> D L9 1-17 IBIB ABS

L9 ANSWER 1 OF 17 USPATFULL

ACCESSION NUMBER: 2002:38872 USPATFULL

TITLE: Method for optimizing drill bit design parameters

INVENTOR(S): Civolani, Lorenzo, Castel Maggiore, ITALY  
Zausa, Fabrizio, Milanese, ITALY

PATENT ASSIGNEE(S): Smith International, Inc., Houston, TX, United States  
(U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6349595	B1	20020226
APPLICATION INFO.:	US 2000-671231		20000927 (9)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1999-157444P	19991004 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Williams, Hezron	
ASSISTANT EXAMINER:	Politzer, Jay L.	
LEGAL REPRESENTATIVE:	Rosenthal & Osha L.L.P.	
NUMBER OF CLAIMS:	18	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	7 Drawing Figure(s); 5 Drawing Page(s)	
LINE COUNT:	584	

AB A method for selecting a **drilling** parameter is disclosed. The method includes determining a loading displacement relationship for samples of **earth** formations. The loading displacement measurements are made by an indenter. The **drilling** parameter is selected from the loading displacement relationship. In one embodiment of the invention, the loading displacement relationship is determined from cuttings made during **drilling** of a wellbore. The loading displacement relationship determined during **drilling** is used to select at least one **drilling** parameter during **drilling** to improve **drilling** performance. **Drilling** parameters which can be selected include mill tooth and/or insert **bit** type; type of gauge protection to be used on the **bit**; type, size and orientation of jet nozzles on the

bit; and blade structure, cutter type and density as well as the  
cutter impact distance for fixed cutter bit. Other  
drilling parameters include weight on bit, drill  
bit rotation rate, and drilling fluid flow rate.

L9 ANSWER 2 OF 17 USPATFULL

ACCESSION NUMBER: 2001:156871 USPATFULL

TITLE: Apparatus and method for a roller bit using  
collimated jets sweeping separate bottom-hole  
tracks

INVENTOR(S): Crawford, Micheal B., Duncanville, TX, United States

PATENT ASSIGNEE(S): Halliburton Engrey Service Inc., Carrollton, TX,  
United

States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6290006	B1	20010918
APPLICATION INFO.:	US 1999-406250		19990927 (9)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1998-102286P	19980929 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Bagnell, David	
ASSISTANT EXAMINER:	Dougherty, Jennifer	
LEGAL REPRESENTATIVE:	Groover & Associates, Groover, Robert, Formby, Betty	
NUMBER OF CLAIMS:	29	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	13 Drawing Figure(s); 9 Drawing Page(s)	
LINE COUNT:	548	

AB A roller cone jet-type drill bit with nozzles which direct  
collimated streams of mud at different angles, to sweep different radii  
of the hole bottom.

L9 ANSWER 3 OF 17 USPATFULL

ACCESSION NUMBER: 2000:158599 USPATFULL

TITLE: Method and apparatus for computing drill bit  
vibration power spectral density

INVENTOR(S): Rodney, Paul F., Spring, TX, United States

PATENT ASSIGNEE(S): Dresser Industries, Inc., Dallas, TX, United States  
(U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6151554		20001121
APPLICATION INFO.:	US 1999-289933		19990412 (9)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	McElheny, Jr., Donald E.		
LEGAL REPRESENTATIVE:	Speight, Howard L.		
NUMBER OF CLAIMS:	24		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	3 Drawing Figure(s); 3 Drawing Page(s)		
LINE COUNT:	834		

AB A power spectrum density processor is located near the drill bit  
while drilling. The power spectral density processor computes  
the power spectral density of the vibrations generated by the drill  
bit while drilling. The power spectral density  
information is telemetered to the surface where it is used to enhance  
drill bit seismic techniques.

L9 ANSWER 4 OF 17 PATFULL

ACCESSION NUMBER: 2000:100765 USPATFULL

TITLE: Rock bit nozzle arrangement

INVENTOR(S): Wells, Jennifer Ann, The Woodlands, TX, United States  
Baker, Wayne Lee, The Woodlands, TX, United States  
Charles, Christopher Steven, Houston, TX, United States

Duggan, James Lynn, Friendswood, TX, United States  
Gottschalk, Thomas John, Houston, TX, United States  
Marvel, Timothy King, The Woodlands, TX, United States  
Ruff, Daniel Edward, Kingwood, TX, United States  
Stuart, Troy Richard, Stafford, TX, United States  
PATENT ASSIGNEE(S): Baker Hughes Incorporated, Houston, TX, United States  
(U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6098728		20000808
APPLICATION INFO.:	US 1998-49523		19980327 (9)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Neuder, William		
LEGAL REPRESENTATIVE:	Duane, Morris & Heckscher LLP		
NUMBER OF CLAIMS:	30		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	9 Drawing Figure(s); 6 Drawing Page(s)		
LINE COUNT:	968		

AB A drillbit with a flexible nozzle system is provided to address bit- and bottom-balling situations. In one embodiment, a given nozzle can have an mounting member which is oblong or another shape so as to be installable into different positions where, in one position, the bit-balling problem is addressed, while in the other, the bottom-balling problem is addressed. Other shapes that provide this flexibility can also be employed. The nozzle body can also be made with a symmetrical mount, with the outlet askew such that the symmetrical mount, when placed in a strategically located nozzle opening, can address bit- or bottom-balling situations by a simple reversal of the orientation where multiple orientations are available for the base. Alternatively, in the area between adjacent cones, multiple nozzle installations can be provided to independently address the bit -balling and bottom-balling situations between adjacent cones. In any given bit, individual nozzles to address bit- or bottom-balling can be mounted between different pairs of cones so as to be able to address both problems in a bit body design that only provides for a single nozzle outlet between each of the cones.

L9 ANSWER 5 OF 17 USPATFULL

ACCESSION NUMBER: 2000:96949 USPATFULL

TITLE: Roller-cone bits,  
systems, drilling methods, and design methods  
with optimization of tooth orientation

INVENTOR(S): Chen, Shilin, Dallas, TX, United States

PATENT ASSIGNEE(S): Halliburton Energy Services, Inc., Carrollton, TX,  
United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6095262		20000801
APPLICATION INFO.:	US 1999-387304		19990831 (9)

NUMBER	DATE
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PRIORITY INFORMATION: US 1998-98466P 19980831 (50)  
DOCUMENT TYPE: Utility  
FILE SEGMENT: Granted  
PRIMARY EXAMINER: Dang, Hoang  
LEGAL REPRESENTATIVE: Groover & Associates  
NUMBER OF CLAIMS: 21  
EXEMPLARY CLAIM: 1,4  
NUMBER OF DRAWINGS: 32 Drawing Figure(s); 21 Drawing Page(s)  
LINE COUNT: 905

AB A novel and improved roller cone drill bit and method of design are disclosed. A roller cone drill bit for drilling through subterranean formations having an upper connection for attachment to a drill string, and a plurality cutting structures rotatably mounted on arms extending downward from the connection. A number of teeth are located in generally concentric rows on each cutting structure. The actual trajectory by which the teeth engage the formation is mathematically determined. A straight-line trajectory is calculated based on the actual trajectory. The teeth are positioned in the cutting structures such each tooth having a designed engagement surface is oriented perpendicular to the calculated straight-line trajectory.

L9 ANSWER 6 OF 17 USPATFULL

ACCESSION NUMBER: 2000:79518 USPATFULL  
TITLE: Drill bits with enhanced hydraulic flow characteristics  
INVENTOR(S): Trujillo, William R., South Salt Lake, UT, United States  
Berzas, Sean K., The Woodlands, TX, United States  
Cooley, Craig H., Bountiful, UT, United States  
Hansen, Wayne R., Centerville, UT, United States  
PATENT ASSIGNEE(S): Baker Hughes Inc., Houston, TX, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6079507		20000627
APPLICATION INFO.:	US 1998-193699		19981117 (9)
RELATED APPLN. INFO.:	Division of Ser. No. US 1997-927058, filed on 10 Sep 1997, now patented, Pat. No. US 5836404 which is a division of Ser. No. US 1996-631448, filed on 12 Apr 1996, now patented, Pat. No. US 5794725		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Tsay, Frank S.		
LEGAL REPRESENTATIVE:	Trask, Britt & Rossa		
NUMBER OF CLAIMS:	16		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	24 Drawing Figure(s); 21 Drawing Page(s)		
LINE COUNT:	895		

AB This invention discloses a drilling structure having a body defining at least one primary channel and at least one secondary channel therein to initiate and maintain recirculation of an amount of drilling fluid back through the secondary channel to maintain positive, independent flow of drilling fluid through each primary channel of the drilling structure. The recirculation of drilling fluid is encouraged by providing a recirculation passageway in fluid communication with the primary channel defined by a portion of the body of the drilling structure that separates positively flowing drilling mud from drilling mud that is being recirculated. The recirculation action of the fluid in the recirculating loop may be fed and brought about by entrainment of the

body fluid with j ed fluid from an adjacent nozzle. The portion of the  
 may form a partition, such as a wall extending at least partially  
 between the sides of the primary channel, a fin positioned within the  
 primary channel that generally radially extends from the centerline of  
 the **drilling** structure, or an internal channel or feeder that  
 extracts fluid from the annulus at a point of low velocity and  
 reintroduces it at a point of higher velocity proximate the bit  
 face, usually near a nozzle. In addition, portions of the  
**drilling** structure are streamlined to further encourage  
 positive, stable flow of fluid and formation cuttings generated from an  
 associated cutting structure.

L9 ANSWER 7 OF 17 USPATFULL

ACCESSION NUMBER: 1999:13065 USPATFULL  
 TITLE: Detecting and reducing bit whirl  
 INVENTOR(S): Chen, Chen-Kang David, Houston, TX, United States  
 PATENT ASSIGNEE(S): Baroid Technology, Inc., Houston, TX, United States  
 (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5864058		19990126
APPLICATION INFO.:	US 1997-881930		19970625 (8)
RELATED APPLN. INFO.:	Continuation of Ser. No. US 1994-311476, filed on 23 Sep 1994, now abandoned		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Brock, Michael		
ASSISTANT EXAMINER:	Politzer, Jay L.		
LEGAL REPRESENTATIVE:	Browning Bushman		
NUMBER OF CLAIMS:	17		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	53 Drawing Figure(s); 25 Drawing Page(s)		
LINE COUNT:	885		

AB A downhole sensor sub is provided in the lower end of a drillstring,  
 such sub having three orthogonally positioned accelerometers for  
 measuring vibration of a **drilling** component such as the drill  
 bit and/or the bottom hole assembly (BHA) along the X,  
 Y and Z axes. The lateral acceleration is measured along either the X  
 or  
 Y axis and then analyzed in the frequency domain as to peak frequency  
 and magnitude at such peak frequency. Backward whirling of the  
**drilling** component is indicated when the magnitude at the peak  
 frequency exceeds a predetermined value. A low whirling frequency  
 accompanied by a high acceleration magnitude based on empirically  
 established values is associated with destructive vibration of the  
**drilling** component. One or more **drilling** parameters  
 (weight on bit, rotary speed, etc.) is then altered to reduce  
 or eliminate such destructive vibration.

L9 ANSWER 8 OF 17 USPATFULL

ACCESSION NUMBER: 1998:142830 USPATFULL  
 TITLE: Drill bits with enhanced hydraulic flow  
 characteristics  
 INVENTOR(S): Trujillo, William R., South Salt Lake, UT, United  
 States  
 Berzas, Sean K., The Woodlands, TX, United States  
 Cooley, Craig H., Bountiful, UT, United States  
 Hansen, Wayne R., Centerville, UT, United States  
 PATENT ASSIGNEE(S): Baker Hughes Incorporated, Houston, TX, United States  
 (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5836404		199811
APPLICATION INFO.:	US 1997-927058		19970910 (8)
RELATED APPLN. INFO.:	Division of Ser. No. US 1996-631448, filed on 12 Apr 1996		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Tsay, Frank		
LEGAL REPRESENTATIVE:	Trask, Britt & Rossa		
NUMBER OF CLAIMS:	12		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	24 Drawing Figure(s); 21 Drawing Page(s)		
LINE COUNT:	861		

AB This invention discloses a **drilling** structure having a body defining at least one primary channel and at least one secondary channel

therein to initiate and maintain recirculation of an amount of **drilling** fluid back through the secondary channel to maintain positive, independent flow of **drilling** fluid through each primary channel of the **drilling** structure. The recirculation of **drilling** fluid is encouraged by providing a recirculation passageway in fluid communication with the primary channel defined by a portion of the body of the **drilling** structure that separates positively flowing **drilling** mud from **drilling** mud that is being recirculated. The recirculation action of the fluid in the

recirculating loop may be fed and brought about by entrainment of the fluid with jetted fluid from an adjacent nozzle. The portion of the

body may form a partition, such as a wall extending at least partially between the sides of the primary channel, a fin positioned within the primary channel that generally radially extends from the centerline of the **drilling** structure, or an internal channel or feeder that extracts fluid from the annulus at a point of low velocity and reintroduces it at a point of higher velocity proximate the **bit** face, usually near a nozzle. In addition, portions of the **drilling** structure are streamlined to further encourage positive, stable flow of fluid and formation cuttings generated from an associated cutting structure.

L9 ANSWER 9 OF 17 USPATFULL

ACCESSION NUMBER:	1998:97767	USPATFULL
TITLE:	Drill <b>bits</b> with enhanced hydraulic flow characteristics	
INVENTOR(S):	Trujillo, William R., South Salt Lake, UT, United States Berzas, Sean K., The Woodlands, TX, United States Cooley, Craig H., Bountiful, UT, United States Hansen, Wayne R., Centerville, UT, United States	
PATENT ASSIGNEE(S):	Baker Hughes I:corporated, Houston, TX, United States (U.S. corporation)	

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5794725		19980818
APPLICATION INFO.:	US 1996-631448		19960412 (8)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Tsay, Frank		
LEGAL REPRESENTATIVE:	Trask, Britt & Rossa		
NUMBER OF CLAIMS:	41		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	24 Drawing Figure(s); 21 Drawing Page(s)		



LINE COUNT: 935

AB This invention discloses a drilling structure having a body a defining at least one primary channel and at least one secondary channel

therein to initiate and maintain recirculation of an amount of drilling fluid back through the secondary channel to maintain positive, independent flow of drilling fluid through each primary channel of the drilling structure. The recirculation of drilling fluid is encouraged by providing a recirculation passageway in fluid communication with the primary channel defined by a portion of the body of the drilling structure that separates positively flowing drilling mud from drilling mud that is being recirculated. The recirculation action of the fluid in the recirculating loop may be fed and brought about by entrainment of the fluid with jetted fluid from an adjacent nozzle. The portion of the body may form a partition, such as a wall extending at least partially between the sides of the primary channel, a fin positioned within the primary channel that generally radially extends from the centerline of the drilling structure, or an internal channel or feeder that extracts fluid from the annulus at a point of low velocity and reintroduces it at a point of higher velocity proximate the bit face, usually near a nozzle. In addition, portions of the drilling structure are streamlined to further encourage positive, stable flow of fluid and formation cuttings generated from an associated cutting structure.

L9 ANSWER 10 OF 17 USPATFULL

ACCESSION NUMBER: 96:89156 USPATFULL

TITLE: Method and apparatus for reducing the vibration and whirling of drill bits and the bottom hole assembly in drilling used to

drill oil and gas wells  
INVENTOR(S): Delwiche, Robert A., 201 Rue Victor Allard, B-1180  
Brussels, Belgium  
Ho, Hwa-Shan, 5411 Mineral Creek Ct., Spring, TX,  
United States 77379

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5560439		19961001
APPLICATION INFO.:	US 1995-424139		19950417 (8)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Neuder, William P.		
LEGAL REPRESENTATIVE:	Browning Bushman		
NUMBER OF CLAIMS:	6		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	8 Drawing Figure(s); 4 Drawing Page(s)		
LINE COUNT:	290		

AB A pair of stabilizers are placed in a string of drill pipe having a drill bit or a coring bit at its lower end, the placement of the stabilizers being such that the distance (d1) between the midpoint (mean transverse section) of the gauge surface of the bit and the midpoint (mean transverse section) of such first stabilizer bears a relationship to the distance (d2) between the midpoints of the two stabilizers. The ratio of d1 to d2 (d1/d2) should be between 1/1.5 to 1/5, and preferably between 1/2 and 1/3, with d1 being maintained less than five feet, preferably less than three feet. In one embodiment, the drill bit and the two stabilizers are formed in a monoblock.

L9 ANSWER 11 OF 1 USPATFULL  
 ACCESSION NUMBER: 92:59055 USPATFULL  
 TITLE: Low friction subterranean drill bit and related methods  
 INVENTOR(S): Brett, J. Ford, 2511 S. Terwilleger, Tulsa, OK, United States 74114  
 Warren, Tommy M., Rte. 1, Coweta, OK, United States 74429  
 Sinor, L. Allen, 2250 S. Oswego Pl., Tulsa, OK, United States 74114  
 Behr, Suzanne M., 2419 E. 55th Pl., #30, Tulsa, OK, United States 74105

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5131478		19920721
APPLICATION INFO.:	US 1990-550785		19900710 (7)
RELATED APPLN. INFO.:	Continuation-in-part of Ser. No. US 1989-313126, filed on 21 Feb 1989, now abandoned		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Dang, Hoang C.		
LEGAL REPRESENTATIVE:	Brown, Scott H., Hook, Fred E.		
NUMBER OF CLAIMS:	26		
EXEMPLARY CLAIM:	25		
NUMBER OF DRAWINGS:	41 Drawing Figure(s); 21 Drawing Page(s)		
LINE COUNT:	2065		

AB A subterranean drill bit operable with a rotational drive source is provided for **drilling** in subterranean earthen materials to create a borehole having a borehole wall. The drill bit comprises a drill bit body having a base portion, a gauge portion and a face portion disposed about a bit axis. A plurality of diamond cutting elements are fixedly disposed on and project from the face portion and are spaced from one another. The cutting elements are disposed for causing a net radial imbalance force during the **drilling** along a net radial imbalance force vector substantially perpendicular to the bit axis. A substantially continuous cutter devoid region is disposed on the gauge portion about the force point, and a bearing support is disposed in the cutter devoid region about the force point for substantially continuously contacting the borehole wall during the **drilling**. The cutting elements are positioned to cause the net radial imbalance force to substantially maintain the bearing support in contact with the borehole wall during the **drilling**, to cause the net radial imbalance force vector to have an equilibrium direction, and to cause the net radial imbalance force vector to return substantially to the equilibrium direction in response to a disturbing displacement.

L9 ANSWER 12 OF 17 USPATFULL  
 ACCESSION NUMBER: 90:2055 USPATFULL  
 TITLE: Kerf-cutting apparatus and method for improved **drilling** rates  
 INVENTOR(S): Holster, Jesse L., Spring, TX, United States  
 PATENT ASSIGNEE(S): Exxon Production Research Company, Houston, TX, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 4892159		19900109
APPLICATION INFO.:	US 1988-277166		19881129 (7)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Neuder, William P.		
LEGAL REPRESENTATIVE:	Wilson, Pamela L.		

NUMBER OF CLAIMS: 35  
EXEMPLARY CLAIM: 1  
NUMBER OF DRAWINGS: 10 Drawing Figure(s); 5 Drawing Page(s)  
LINE COUNT: 657

AB An earth drilling bit that cuts concentric annular kerfs ahead of primary drilling means and thereby increases drilling rate. The bit includes a bit body having a lower end forming an annular cutter for cutting an outer annular kerf, an inner drill member positioned concentrically within the bit body having a lower end forming an annular cutter for cutting an inner annular kerf, a plurality of rotary drilling members attachedly arranged between the bit body and inner drill member positioned so lowermost cutting edges are above lowermost edges of the annular cutters of the bit body and inner drill member for removing material between the outer and inner annular kerfs, and plurality of drilling members attachedly arranged within the inner drill member positioned so lowermost cutting edges are above lowermost edges of the annular cutter of the inner drill member for removing material within the inner annular kerf.

L9 ANSWER 13 OF 17 USPATFULL  
ACCESSION NUMBER: 89:10275 USPATFULL  
TITLE: Method of predicting and controlling the drilling trajectory in directional wells  
INVENTOR(S): Ho, Hwa-Shan, Spring, TX, United States  
PATENT ASSIGNEE(S): NL Industries, Inc., New York, NY, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 4804051		19890214
APPLICATION INFO.:	US 1987-100912		19870925 (7)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Massie, Jerome W.		
ASSISTANT EXAMINER:	Neuder, William P.		
LEGAL REPRESENTATIVE:	Browning, Bushman, Zamecki & Anderson		
NUMBER OF CLAIMS:	16		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	12 Drawing Figure(s); 7 Drawing Page(s)		
LINE COUNT:	1007		

AB The methods disclosed herein incorporate the basic concepts and methodologies of a new general rock-bit interaction model useful in predicting and controlling drilling trajectories in directional (and deep vertical) wells. It accounts for the anisotropic drilling characteristics of both the formation and the bit. The model is developed in a 3-D geometry. Therefore, it is capable of predicting the walk tendency and the build-drop tendency of a given BHA (bottomhole assembly) under any drilling condition. The model can be used in the forward mode to predict the drilling direction; in the inverse mode to generate the rock and bit anisotropy indices; and in the log-generation mode to generate drilling logs, such as a drilling dip log.

L9 ANSWER 14 OF 17 USPATFULL  
ACCESSION NUMBER: 83:27232 USPATFULL  
TITLE: Cavitating liquid jet assisted drill bit and method for deep-hole drilling  
INVENTOR(S): Johnson, Jr., Virgil E., Gaithersburg, MD, United States

PATENT ASSIGNEE(S): Sundaram, T. R., Columbia, MD, United States  
Conn, Andrew F., Baltimore, MD, United States  
Hydronautics, Incorporated, Laurel, MD, United States  
(U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 4391339		19830705
APPLICATION INFO.:	US 1980-211662		19801201 (6)
RELATED APPLN. INFO.:	Continuation of Ser. No. US 1978-931244, filed on 4 Aug		

DOCUMENT TYPE: 1978, now patented, Pat. No. US 4262757  
UTILITY TYPE:  
FILE SEGMENT: Utility  
PRIMARY EXAMINER: Granted  
LEGAL REPRESENTATIVE: Pate, III, William F.  
NUMBER OF CLAIMS: Finnegan, Henderson, Farabow, Garrett & Dunner  
EXEMPLARY CLAIM: 4  
NUMBER OF DRAWINGS: 1  
LINE COUNT: 7 Drawing Figure(s); 3 Drawing Page(s)  
426

AB A drill bit and a method for deep-hole  
drilling in which the drill bit has mechanical cutting  
means located on its lower cutting face for cutting a solid surface  
upon  
rotation of the bit and a plurality of cavitating liquid jet  
nozzles spaced around the face of the bit to assist in the  
drilling action, the nozzles being located so as to discharge a  
plurality of downwardly directed and concentric liquid jets that  
cavitate to fracture the surface to be drilled in a series of  
non-overlapping slots as the bit is rotated.

L9 ANSWER 15 OF 17 USPATFULL

ACCESSION NUMBER: 81:21427 USPATFULL  
TITLE: Cavitating liquid jet assisted drill bit and  
method for deep-hole drilling  
INVENTOR(S): Johnson, Jr., Virgil E., Gaithersburg, MD, United  
States  
Sundaram, T. R., Columbia, MD, United States  
Conn, Andrew F., Baltimore, MD, United States  
PATENT ASSIGNEE(S): Hydronautics, Incorporated, Laurel, MD, United States  
(U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 4262757		19810421
APPLICATION INFO.:	US 1978-931244		19780804 (5)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Leppink, James A.		
ASSISTANT EXAMINER:	Favreau, Richard E.		
NUMBER OF CLAIMS:	14		
EXEMPLARY CLAIM:	10		
NUMBER OF DRAWINGS:	7 Drawing Figure(s); 3 Drawing Page(s)		
LINE COUNT:	489		
AB	A drill bit and a method for deep-hole drilling in which the drill bit has mechanical cutting means located on its lower cutting face for cutting a solid surface upon rotation of the bit and a plurality of cavitating liquid jet nozzles spaced around the face of the bit to assist in the drilling action, the nozzles being located so as to discharge a plurality of downwardly directed and concentric liquid jets that cavitate to fracture the surface to be drilled in a series of non-overlapping slots as the bit is rotated.		

L9 ANSWER 16 OF 17 .SPATFULL  
ACCESSION NUMBER: 78:56888 USPATFULL  
TITLE: Method and apparatus for water jet drilling  
of rock  
INVENTOR(S): Summers, David A., Rolla, MO, United States  
Mazurkiewicz, Marian, Wroclaw, Poland  
Bushnell, Dwight J., Corvallis, OR, United States  
Blaine, James, Rolla, MO, United States  
PATENT ASSIGNEE(S): The Curators of the University of Missouri, Columbia,  
MO, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 4119160		19781010
APPLICATION INFO.:	US 1977-763926		19770131 (5)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Purser, Ernest R.		
ASSISTANT EXAMINER:	Favreau, Richard E.		
LEGAL REPRESENTATIVE:	Snyder, Ray E.		
NUMBER OF CLAIMS:	4		
EXEMPLARY CLAIM:	4		
NUMBER OF DRAWINGS:	8 Drawing Figure(s); 2 Drawing Page(s)		
LINE COUNT:	330		

AB Rock **drilling** method and apparatus utilizing high pressure water jets for **drilling holes** of relatively small diameter at speeds significantly greater than that attainable with existing **drilling** tools. Greatly increased **drilling** rates are attained due to jet nozzle geometry and speed of rotation.

The jet nozzle design has two orifices, one pointing axially ahead in the direction of travel and the second inclined at an angle of approximately 30.degree. from the axis. The two orifices have diameters in the ratio of approximately 1:2. Liquid jet velocities in excess of 1,000 ft/sec are used, and the nozzle is rotated at speeds up to 1,000 rpm and higher.

L9 ANSWER 17 OF 17 EUROPATFULL COPYRIGHT 2002 WILA

PATENT APPLICATION - PATENTANMELDUNG - DEMANDE DE BREVET

ACCESSION NUMBER: 467580 EUROPATFULL EW 199204 FS OS STA B  
TITLE: Subterranean drill **bit** and related methods.  
Unterirdischer Bohrmeissel und zugehoeriges Verfahren.  
Trepan de forage souterrain et procedes associes.  
INVENTOR(S): Brett, James Ford, 2511 S. Terwilliger, Tulsa, Ok.  
74114, US;  
Warren, Tommy Melvin, Rt. 1, Box 130-10, Coweta, OK  
74429, US;  
Sinor, Lawrence Allen, 2250 S. Oswego Pl., Tulsa, OK  
74114, US;  
Behr, Suzanne Margaret, 2419 E. 55th Place, Tulsa, OK  
74105, US  
PATENT ASSIGNEE(S): AMOCO CORPORATION (an Indiana corp.), 200 East Randolph  
Drive, Chicago Illinois 60601, US  
PATENT ASSIGNEE NO: 683005  
AGENT: Garratt, Peter Douglas et al, Mathys & Squire 10 Fleet  
Street, London EC4Y 1AY, GB  
AGENT NUMBER: 43121  
OTHER SOURCE: ESP1992007 EP 0467580 A1 920122  
SOURCE: Wila-EPZ-1992-H04-T1

DOCUMENT TYPE: Patent  
 LANGUAGE: Anmeldung in Englisch; Veroeffentlichung in Englisch  
 DESIGNATED STATES: R BE; R DE; R FR; R GB  
 PATENT INFO.PUB.TYPE: EPAL EUROPAEISCHE PATENTANMELDUNG  
 PATENT INFORMATION:

PATENT NO	KIND	DATE
EP 467580	A1	19920122
		19920122
EP 1991-306247		19910710
US 1990-550785		19900710

GRANTED PATENT - ERTEILTES PATENT - BREVET DELIVRE

ACCESSION NUMBER: 467580 EUROPATFULL EW 199440 FS PS STA B  
 TITLE: Subterranean drill bit and related methods.  
 Unterirdischer Bohrmeissel und zugehoeriges Verfahren.  
 Trepan de forage souterrain et procedes associes.  
 INVENTOR(S): Brett, James Ford, 2511 S. Terwilliger, Tulsa, Ok.  
 74114, US;  
 Warren, Tommy Melvin, Rt. 1, Box 130-10, Coweta, OK  
 74429, US;  
 Sinor, Lawrence Allen, 2250 S. Oswego Pl., Tulsa, OK  
 74114, US;  
 Behr, Suzanne Margaret, 2419 E. 55th Place, Tulsa, OK  
 74105, US  
 PATENT ASSIGNEE(S): AMOCO CORPORATION (an Indiana corp.), 200 East Randolph  
 Drive, Chicago Illinois 60601, US  
 PATENT ASSIGNEE NO: 683005  
 AGENT: Garratt, Peter Douglas et al, Mathys & Squire 10 Fleet  
 Street, London EC4Y 1AY, GB  
 AGENT NUMBER: 43121  
 OTHER SOURCE: EPB1994071 EP 0467580 B1 941005  
 SOURCE: Wila-EPS-1994-H40-T1  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Anmeldung in Englisch; Veroeffentlichung in Englisch  
 DESIGNATED STATES: R BE; R DE; R FR; R GB  
 PATENT INFO.PUB.TYPE: EPB1 EUROPAEISCHE PATENTSCHRIFT  
 PATENT INFORMATION:

PATENT NO	KIND	DATE
EP 467580	B1	19941005
		19920122
EP 1991-306247		19910710
US 1990-550785		19900710
EP 430590 A	GB	2238335 A
US 2074951 A	US	4815342 A

REF. NON-PATENT-LIT.: RESEARCH DISCLOSURE vol. 288, April 1988, NEW  
 YORK'Eccentric PDC-bit with cutter row replacing one  
 sector of the gauge section'

=> D HIS

(FILE 'HOME' ENTERED AT 10:49:56 ON 06 MAY 2002)

FILE 'USPATFULL, USPAT2, INSPEC, EUROPATFULL' ENTERED AT 10:50:11 ON 06 MAY 2002

L1 18359 S DRILLING AND BIT  
L2 300 S L1 AND ROLLER CONE BIT?  
L3 215 S L2 AND EARTH  
L4 8 S L3 AND CRATER  
L5 186 S L3 AND HOLE  
L6 12 S L5 AND BOTTOMHOLE

=> D L6 1-12 IBIB ABS

L6 ANSWER 1 OF 12 USPATFULL

ACCESSION NUMBER: 2001:88456 USPATFULL

TITLE: Bit torque limiting device

INVENTOR(S): Tibbitts, Gordon A., Salt Lake City, UT, United States

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2001000591	A1	20010503
	US 6325163	B2	20011204
APPLICATION INFO.:	US 2000-731675	A1	20001206 (9)
RELATED APPLN. INFO.:	Division of Ser. No. US 1998-172509, filed on 14 Oct 1998, GRANTED, Pat. No. US 6182774 Division of Ser.		
No.	US 1997-821465, filed on 21 Mar 1997, GRANTED, Pat.		
No.	US 5947214		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	APPLICATION		
LEGAL REPRESENTATIVE:	TRASK BRITT, P.O. BOX 2550, SALT LAKE CITY, UT, 84110		
NUMBER OF CLAIMS:	37		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	13 Drawing Page(s)		
LINE COUNT:	855		

AB A torque limiting device that allows a drill string to rotate relative to the cutting structure of the bit when a predetermined torque is applied between the cutting structure of the drill bit and the drill string. The torque limiting device utilizes a retaining member which restricts rotational movement of a first component of the torque limiting device relative to a second component. When a sufficient torque load is placed on the cutting structure of the drill bit, the retaining member allows rotational movement of the first component relative to the second component and allows the drill string to continue to rotate relative to the cutting structure of the bit until the torque is sufficiently reduced. The torque limiting device may be an integral part of a drill bit, may be a separate device attached between the drill string and the drill bit or between the drill string and a downhole motor, or may be part of a near-bit sub or incorporated in a downhole motor.

L6 ANSWER 2 OF 12 PATFULL  
 ACCESSION NUMBER: 2001:88068 USPATFULL  
 TITLE: Bit torque limiting device  
 INVENTOR(S): Tibbitts, Gordon A., Salt Lake City, UT, United States

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2001000202	A1	20010412
	US 6357538	B2	20020319
APPLICATION INFO.:	US 2000-731109	A1	20001206 (9)
RELATED APPLN. INFO.:	Division of Ser. No. US 1998-172509, filed on 14 Oct 1998, GRANTED, Pat. No. US 6182774 Division of Ser. No.		
	US 1997-821465, filed on 21 Mar 1997, GRANTED, Pat.		
DOCUMENT TYPE:	US 5947214		
FILE SEGMENT:	Utility		
LEGAL REPRESENTATIVE:	APPLICATION		
NUMBER OF CLAIMS:	TRASK BRITT, P.O. BOX 2550, SALT LAKE CITY, UT, 84110		
EXEMPLARY CLAIM:	45		
NUMBER OF DRAWINGS:	1		
LINE COUNT:	13 Drawing Page(s)		
AB	892		
	A torque limiting device that allows a drill string to rotate relative to the cutting structure of the bit when a predetermined torque is applied between the cutting structure of the drill bit and the drill string. The torque limiting device utilizes a retaining member which restricts rotational movement of a first component of the torque limiting device relative to a second component. When a sufficient torque load is placed on the cutting structure of the drill bit, the retaining member allows rotational movement of the first component relative to the second component and allows the drill string to continue to rotate relative to the cutting structure of the bit until the torque is sufficiently reduced. The torque limiting device may be an integral part of a drill bit, may be a separate device attached between the drill string and the drill bit or between the drill string and a downhole motor, or may be part of a near-bit sub or incorporated in a downhole motor.		

L6 ANSWER 3 OF 12 USPATFULL  
 ACCESSION NUMBER: 2001:17024 USPATFULL  
 TITLE: Bit torque limiting device  
 INVENTOR(S): Tibbitts, Gordon A., Salt Lake City, UT, United States  
 PATENT ASSIGNEE(S): Baker Hughes Incorporated, Houston, TX, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6182774	B1	20010206
APPLICATION INFO.:	US 1998-172509		19981014 (9)
RELATED APPLN. INFO.:	Division of Ser. No. US 1997-821465, filed on 21 Mar 1997, now patented, Pat. No. US 5947214		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Schoeppel, Roger		
LEGAL REPRESENTATIVE:	Trask Britt		
NUMBER OF CLAIMS:	27		
EXEMPLARY CLAIM:	1		



NUMBER OF DRAWINGS: 17 Drawing Figure(s); 13 Drawing Page(s)

LINE COUNT: 772

AB A torque limiting device that allows a drill string to rotate relative to the cutting structure of the bit when a predetermined torque is applied between the cutting structure of the drill bit and the drill string. The torque limiting device utilizes a retaining member which restricts rotational movement of a first component of the torque limiting device relative to a second component. When a sufficient torque load is placed on the cutting structure of the drill bit, the retaining member allows rotational movement of the first component relative to the second component and allows the drill string to continue to rotate relative to the cutting structure of the bit until the torque is sufficiently reduced. The torque limiting device may be an integral part of a drill bit, may be a separate device attached between the drill string and the drill bit or between the drill string and a downhole motor, or may be part of a near-bit sub or incorporated in a downhole motor.

L6 ANSWER 4 OF 12 USPATFULL

ACCESSION NUMBER: 2000:96949 USPATFULL

TITLE: Roller-cone bits, systems, drilling methods, and design methods with optimization of tooth orientation

INVENTOR(S): Chen, Shilin, Dallas, TX, United States

PATENT ASSIGNEE(S): Halliburton Energy Services, Inc., Carrollton, TX, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6095262		20000801
APPLICATION INFO.:	US 1999-387304		19990831 (9)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1998-98466P	19980831 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Dang, Hoang	
LEGAL REPRESENTATIVE:	Groover & Associates	
NUMBER OF CLAIMS:	21	
EXEMPLARY CLAIM:	1,4	
NUMBER OF DRAWINGS:	32 Drawing Figure(s); 21 Drawing Page(s)	
LINE COUNT:	905	

AB A novel and improved roller cone drill bit and method of design are disclosed. A roller cone drill bit for drilling through subterranean formations having an upper connection for attachment to a drill string, and a plurality cutting structures rotatably mounted on arms extending downward from the connection. A number of teeth are located in generally concentric rows on each cutting structure. The actual trajectory by which the teeth engage the formation is mathematically determined. A straight-line trajectory is calculated based on the actual trajectory. The teeth are positioned in the cutting structures such each tooth having a designed engagement surface is oriented perpendicular to the calculated straight-line trajectory.

L6 ANSWER 5 OF 12 USPATFULL

ACCESSION NUMBER: 1999:104896 USPATFULL

TITLE: BIT torque limiting device

INVENTOR(S): Tibbitts, Gordon A., Salt Lake City, UT, United States  
PATENT ASSIGNEE(S): Baker Hughes Incorporated, Houston, TX, United States  
(U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5947214		19990907
APPLICATION INFO.:	US 1997-821465		19970321 (8)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Schoeppel, Roger		
LEGAL REPRESENTATIVE:	Trask, Britt & Rossa		
NUMBER OF CLAIMS:	30		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	17 Drawing Figure(s); 13 Drawing Page(s)		
LINE COUNT:	755		

AB A torque limiting device that allows a drill string to rotate relative to the cutting structure of the bit when a predetermined torque is applied between the cutting structure of the drill bit and the drill string. The torque limiting device utilizes a retaining member which restricts rotational movement of a first component of the torque limiting device relative to a second component. When a sufficient torque load is placed on the cutting structure of the drill bit, the retaining member allows rotational movement of the first component relative to the second component and allows the drill string to continue to rotate relative to the cutting structure of the bit until the torque is sufficiently reduced. The torque limiting device may be an integral part of a drill bit, maybe a separate device attached between the drill string and the drill bit or between the drill string and a downhole motor, or may be part of a near-bit sub or incorporated in a downhole motor.

L6 ANSWER 6 OF 12 USPATFULL

ACCESSION NUMBER: 1999:17906 USPATFULL  
TITLE: Steel tooth cutter element with gage facing knee  
INVENTOR(S): Cisneros, Dennis, Kingwood, TX, United States  
McDonough, Scott D., Houston, TX, United States  
Minikus, James C., Spring, TX, United States  
Cawthorne, Chris E., The Woodlands, TX, United States  
PATENT ASSIGNEE(S): Smith International, Inc., Houston, TX, United States  
(U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 5868213		19990209
APPLICATION INFO.:	US 1997-833334		19970404 (8)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Schoeppel, Roger		
LEGAL REPRESENTATIVE:	Conley, Rose & Tayon, P.C.		
NUMBER OF CLAIMS:	74		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	40 Drawing Figure(s); 20 Drawing Page(s)		
LINE COUNT:	1776		

AB A steel tooth, particularly suited for use in a rolling cone bit, includes a root region, a cutting tip spaced from the root region and a gage facing surface therebetween. The gage facing surface includes a knee, and is configured such that the cutting tip is maintained at a position off the gage curve. So positioned, the cutting tip is freed from having to perform any substantial cutting duty in the corner on the

borehole corner, and instead may be configured and optimized for bottom hole cutting. The knee on the gage facing face is configured and positioned so as to serve primarily to cut the borehole wall. It is preferred that the knee be positioned off gage, but that it be closer to the gage curve than the cutting tip.

L6 ANSWER 7 OF 12 USPATFULL

ACCESSION NUMBER: 91:481 USPATFULL  
TITLE: Diamond drag bit for soft formations  
INVENTOR(S): Knowlton, R. Helene, Houston, TX, United States  
Azar, Michael G., Houston, TX, United States  
PATENT ASSIGNEE(S): Smith International, Inc., Houston, TX, United States  
(U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 4981184		19910101
APPLICATION INFO.:	US 1988-274169		19881121 (7)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Neuder, William P.		
LEGAL REPRESENTATIVE:	Upton, Robert G.		
NUMBER OF CLAIMS:	13		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	11 Drawing Figure(s); 3 Drawing Page(s)		
LINE COUNT:	459		

AB A drag bit for soft formation is disclosed which consists of a new cutting mechanism. The drag bit face forms one or more pairs of radially disposed ridges separated by a valley whereby a leading ridge supports multiple rounded projections and the following ridge supports multiple positive rake angle cutters. The rounded projection elements move aside an elastic earth formation and the separated and trailing cutters clip off the dislodged formation to advance the bit in a borehole.

L6 ANSWER 8 OF 12 USPATFULL

ACCESSION NUMBER: 89:93446 USPATFULL  
TITLE: Stabilizing and drilling apparatus and method  
INVENTOR(S): Warren, Tommy M., Coweta, OK, United States  
Winters, Warren J., Tulsa, OK, United States  
Brett, Jame F., Tulsa, OK, United States  
PATENT ASSIGNEE(S): Amoco Corporation, Chicago, IL, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 4881605		19891121
APPLICATION INFO.:	US 1988-244767		19880915 (7)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Bui, Thuy M.		
LEGAL REPRESENTATIVE:	Brown, Scott H., Hook, Fred E.		
NUMBER OF CLAIMS:	4		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	6 Drawing Figure(s); 5 Drawing Page(s)		
LINE COUNT:	670		

AB To stabilize a drill string and to reduce or prevent wellbore deviation in directional drilling, weight rods by which weight is to be applied to drill bit are maintained free-standing and under compression within a drill string while the drill string itself is maintained in tension to limit or prevent lateral deviation of the weight rods in compression. Weight provided by the weight rods is transferred to the drill bit through a load transfer member in

compression      nected between the drill string and the drill bit

L6    ANSWER 9 OF 12    USPATFULL

ACCESSION NUMBER:      89:10275    USPATFULL

TITLE:                      Method of predicting and controlling the  
                             **drilling** trajectory in directional wells

INVENTOR(S):              Ho, Hwa-Shan, Spring, TX, United States

PATENT ASSIGNEE(S):      NL Industries, Inc., New York, NY, United States (U.S.  
                             corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 4804051		19890214
APPLICATION INFO.:	US 1987-100912		19870925    (7)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Massie, Jerome W.		
ASSISTANT EXAMINER:	Neuder, William P.		
LEGAL REPRESENTATIVE:	Browning, Bushman, Zamecki & Anderson		
NUMBER OF CLAIMS:	16		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	12 Drawing Figure(s); 7 Drawing Page(s)		
LINE COUNT:	1007		

AB      The methods disclosed herein incorporate the basic concepts and methodologies of a new general rock-bit interaction model useful in predicting and controlling **drilling** trajectories in directional (and deep vertical) wells. It accounts for the anisotropic **drilling** characteristics of both the formation and the **bit**. The model is developed in a 3-D geometry. Therefore, it is capable of predicting the walk tendency and the build-drop tendency of

a

        given BHA (**bottomhole** assembly) under any **drilling** condition. The model can be used in the forward mode to predict the **drilling** direction; in the inverse mode to generate the rock and **bit** anisotropy indices; and in the log-generation mode to generate **drilling** logs, such as a **drilling** dip log.

L6    ANSWER 10 OF 12    USPAT2

ACCESSION NUMBER:      2001:88456    USPAT2

TITLE:                      **Bit** torque limiting device

INVENTOR(S):              Tibbitts, Gordon A., Salt Lake City, UT, United States

PATENT ASSIGNEE(S):      Baker Hughes Incorporated, Houston, TX, United States  
                             (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6325163	B2	20011204
APPLICATION INFO.:	US 2000-731675		20001206    (9)
RELATED APPLN. INFO.:	Division of Ser. No. US 1998-172509, filed on 14 Oct 1998, now patented, Pat. No. US 6182774 Division of Ser. No. US 1997-821465, filed on 21 Mar 1997, now patented, Pat. No. US 5947214, issued on 7 Sep 1999		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	GRANTED		
PRIMARY EXAMINER:	Schoeppel, Roger		
LEGAL REPRESENTATIVE:	TraskBritt		
NUMBER OF CLAIMS:	37		
EXEMPLARY CLAIM:	1.		
NUMBER OF DRAWINGS:	17 Drawing Figure(s); 13 Drawing Page(s)		
LINE COUNT:	862		

AB      A torque limiting device that allows a drill string to rotate relative to the cutting structure of the **bit** when a predetermined

torque is applied between the cutting structure of the drill bit and the drill string. The torque limiting device utilizes a retaining member which restricts rotational movement of a first component of the torque limiting device relative to a second component. When a sufficient torque load is placed on the cutting structure of the drill bit, the retaining member allows rotational movement of the first component relative to the second component and allows the drill string to continue to rotate relative to the cutting structure of the bit until the torque is sufficiently reduced. The torque limiting device may be an integral part of a drill bit, may be a separate device attached between the drill string and the drill bit or between the drill string and a downhole motor, or may be part of a near-bit sub or incorporated in a downhole motor.

L6 ANSWER 11 OF 12 USPAT2

ACCESSION NUMBER: 2001:88068 USPAT2

TITLE: Bit torque limiting device

INVENTOR(S): Tibbitts, Gordon A., Salt Lake City, UT, United States

PATENT ASSIGNEE(S): Baker Hughes Incorporated, Houston, TX, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6357538	B2	20020319
APPLICATION INFO.:	US 2000-731109		20001206 (9)
RELATED APPLN. INFO.:	Division of Ser. No. US 1998-172509, filed on 14 Oct 1998, now patented, Pat. No. US 6182774 Division of Ser. No. US 1997-821465, filed on 21 Mar 1997, now patented, Pat. No. US 5947214, issued on 17 Sep 1999		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	GRANTED		
PRIMARY EXAMINER:	Schoeppel, Roger		
LEGAL REPRESENTATIVE:	TraskBritt		
NUMBER OF CLAIMS:	18		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	17 Drawing Figure(s); 13 Drawing Page(s)		
LINE COUNT:	765		

AB A torque limiting device that allows a drill string to rotate relative to the cutting structure of the bit when a predetermined torque is applied between the cutting structure of the drill bit and the drill string. The torque limiting device utilizes a retaining member which restricts rotational movement of a first component of the torque limiting device relative to a second component. When a sufficient torque load is placed on the cutting structure of the drill bit, the retaining member allows rotational movement of the first component relative to the second component and allows the drill string to continue to rotate relative to the cutting structure of the bit until the torque is sufficiently reduced. The torque limiting device may be an integral part of a drill bit, may be a separate device attached between the drill string and the drill bit or between the drill string and a downhole motor, or may be part of a near-bit sub or incorporated in a downhole motor.

L6 ANSWER 12 OF 12 EUROPATFULL COPYRIGHT 2002 WILA

PATENT APPLICATION - ENTANMELDUNG - DEMANDE DE BREVET

ACCESSION NUMBER: 370717 EUROPATFULL EW 19. 12 FS OS STA B  
 TITLE: Diamond drag bit for soft formations.  
 Diamant-Fraesmeissel fuer weiche Formationen.  
 Trepan racleur diamante pour formations molles.  
 INVENTOR(S): Knowlton, Helene R., 8130 Split Oak Drive, Houston  
 Texas  
 77040, US;  
 Azar, Michael G., 16214 North Trail Dr., Houston Texas  
 77073, US  
 PATENT ASSIGNEE(S): SMITH INTERNATIONAL, INC., 16740 Hardy Street, Houston,  
 TX 77032, US  
 PATENT ASSIGNEE NO: 348581  
 AGENT: Molyneaux, Martyn William et al, c/o Ladas & Parry  
 Isartorplatz 5, D-8000 Munich 2, DE  
 AGENT NUMBER: 34013  
 OTHER SOURCE: ESP1990025 EP 0370717 A1 900530  
 SOURCE: Wila-EPZ-1990-H22-T1  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Anmeldung in Englisch; Veroeffentlichung in Englisch  
 DESIGNATED STATES: R DE; R FR; R GB; R NL  
 PATENT INFO.PUB.TYPE: EPA1 EUROPAEISCHE PATENTANMELDUNG  
 PATENT INFORMATION:

	PATENT NO	KIND	DATE
	EP 370717	A1	19900530
'OFFENLEGUNGS' DATE:			19900530
APPLICATION INFO.:	EP 1989-311977		19891120
PRIORITY APPLN. INFO.:	US 1988-274169		19881121

GRANTED PATENT - ERTEILTES PATENT - BREVET DELIVRE

ACCESSION NUMBER: 370717 EUROPATFULL EW 199337 FS PS STA B  
 TITLE: Diamond drag bit for soft formations.  
 Diamant-Fraesmeissel fuer weiche Formationen.  
 Trepan racleur diamante pour formations molles.  
 INVENTOR(S): Knowlton, Helene R., 8130 Split Oak Drive, Houston  
 Texas  
 77040, US;  
 Azar, Michael G., 16214 North Trail Dr., Houston Texas  
 77073, US  
 PATENT ASSIGNEE(S): SMITH INTERNATIONAL, INC., 16740 Hardy Street, P.O. Box  
 60068, Houston, Texas 77032, US  
 PATENT ASSIGNEE NO: 348581  
 AGENT: Molyneaux, Martyn William et al, c/o Ladas & Parry,  
 Altheimer Eck 2, D-80331 Muenchen, DE  
 AGENT NUMBER: 34013  
 OTHER SOURCE: EPB1993047 EP 0370717 B1 930915  
 SOURCE: Wila-EPS-1993-H37-T1  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Anmeldung in Englisch; Veroeffentlichung in Englisch  
 DESIGNATED STATES: R DE; R FR; R GB; R NL  
 PATENT INFO.PUB.TYPE: EPB1 EUROPAEISCHE PATENTSCHRIFT  
 PATENT INFORMATION:

	PATENT NO	KIND	DATE
	EP 370717	B1	19930915
'OFFENLEGUNGS' DATE:			19900530
APPLICATION INFO.:	EP 1989-311977		19891120
PRIORITY APPLN. INFO.:	US 1988-274169		19881121
REFERENCE PAT. INFO.:	EP 107630 A		EP 169683 A
	EP 225082 A		EP 291314 A
	GB 2095724 A		GB 2188354 A
	US 4554986 A		

=> D HIS

(FILE 'HOME' ENTERED AT 10:49:56 ON 06 MAY 2002)

FILE 'USPATFULL, USPAT2, INSPEC, EUROPATFULL' ENTERED AT 10:50:11 ON 06 MAY 2002

L1 18359 S DRILLING AND BIT  
L2 300 S L1 AND ROLLER CONE BIT?  
L3 215 S L2 AND EARTH  
L4 8 S L3 AND CRATER

=> D L4 1-8 IBIB ABS

L4 ANSWER 1 OF 8 USPATFULL

ACCESSION NUMBER: 2001:175228 USPATFULL  
TITLE: Steel tooth cutter element with expanded crest  
INVENTOR(S): Steinke, Stephen C., The Woodlands, TX, United States  
Portwood, Gary R., Kingwood, TX, United States  
Garcia, Gary E., The Woodlands, TX, United States  
Moran, David P., The Woodlands, TX, United States

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 2001027881	A1	20011011
	US 6367568	B2	20020409
APPLICATION INFO.:	US 2001-858138	A1	20010515 (9)
RELATED APPLN. INFO.:	Division of Ser. No. US 1998-146095, filed on 3 Sep 1998, GRANTED, Pat. No. US 6241034		

	NUMBER	DATE
PRIORITY INFORMATION:	US 1997-57915P	19970904 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	APPLICATION	
LEGAL REPRESENTATIVE:	CONLEY ROSE & TAYON, P.C., P. O. BOX 3267, HOUSTON, TX, 77253-3267	
NUMBER OF CLAIMS:	8	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	20 Drawing Page(s)	
LINE COUNT:	826	
AB	A cutter element for a drill bit. The cutter element has a base portion and an extending portion and the extending portion has either a zero draft or a negative draft with respect to the base portion. The non-positive draft allows more of the borehole bottom to be scraped using fewer cutter elements. The cutter elements having non-positive draft can be either tungsten carbide inserts or steel teeth.	

L4 ANSWER 2 OF 8 USPATFULL

ACCESSION NUMBER: 2001:169681 USPATFULL  
TITLE: Cutter element with non-linear, expanded crest  
INVENTOR(S): Minikus, James C., Spring, TX, United States  
Cawthorne, Chris E., The Woodlands, TX, United States

scraped using fewer cutter elements. The cutter elements having non-positive draft can be either tungsten carbide inserts or steel teeth.

L4 ANSWER 4 OF 8 USPATFULL

ACCESSION NUMBER: 2000:169863 USPATFULL

TITLE: Cutter element with non-rectilinear crest

INVENTOR(S): Minikus, James C., 6002 Beufort Way, Spring, TX, United States 77389

Cawthorne, Chris E., 3 Cattail Pl., The Woodlands, TX, United States 77381  
Steinke, Stephen C., 6 Moon Beam Ct., The Woodlands, TX, United States 77381  
Portwood, Gary R., 3703 Fern View Dr., Kingwood, TX, United States 77345  
Garcia, Gary E., 18 Ripple Rush Ct., The Woodlands, TX, United States 77381

Moran, David P., 154 S. Cochran's Green Cir., The Woodlands, TX, United States 77381

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6161634		20001219
APPLICATION INFO.:	US 1998-146154		19980903 (9)

	NUMBER	DATE
PRIORITY INFORMATION:	US 1997-57915P	19970904 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Schoeppel, Roger	
LEGAL REPRESENTATIVE:	Conley, Rose & Tayon, PC	
NUMBER OF CLAIMS:	26	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	89 Drawing Figure(s); 18 Drawing Page(s)	
LINE COUNT:	830	

AB A cutter element for a drill bit. The cutter element has a non-rectilinear crest. The non-rectilinear or curvilinear crest provides

an advantageous distribution of the cutting forces across the body of the cutter elements and thus improves bit life. The curvilinear crest also allows the cutter element to more efficiently lift the portion of the formation that is being cut, thereby improving cutting action in certain formations. The cutter elements can have either positive or non-positive draft and can be tungsten carbide inserts.

L4 ANSWER 5 OF 8 USPATFULL

ACCESSION NUMBER: 2000:96949 USPATFULL

TITLE: Roller-cone bits, systems, drilling methods, and design methods with optimization of tooth orientation

INVENTOR(S): Chen, Shilin, Dallas, TX, United States

PATENT ASSIGNEE(S): Halliburton Energy Services, Inc., Carrollton, TX, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6095262		20000801
APPLICATION INFO.:	US 1999-387304		19990831 (9)



	NUMBER	DATE
PRIORITY INFORMATION:	US 1998-98466P	19980831 (C.,
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	Granted	
PRIMARY EXAMINER:	Dang, Hoang	
LEGAL REPRESENTATIVE:	Groover & Associates	
NUMBER OF CLAIMS:	21	
EXEMPLARY CLAIM:	1,4	
NUMBER OF DRAWINGS:	32 Drawing Figure(s); 21 Drawing Page(s)	
LINE COUNT:	905	

AB A novel and improved roller cone drill bit and method of design are disclosed. A roller cone drill bit for drilling through subterranean formations having an upper connection for attachment to a drill string, and a plurality cutting structures rotatably mounted on arms extending downward from the connection. A number of teeth are located in generally concentric rows on each cutting structure. The actual trajectory by which the teeth engage the formation is mathematically determined. A straight-line trajectory is calculated based on the actual trajectory. The teeth are positioned in the cutting structures such each tooth having a designed engagement surface is oriented perpendicular to the calculated straight-line trajectory.

#### L4 ANSWER 6 OF 8 USPATFULL

ACCESSION NUMBER:	89:81914 USPATFULL
TITLE:	Excavation apparatus, system and method
INVENTOR(S):	Warren, Tommy M., Coweta, OK, United States Winters, Warren J., Tulsa, OK, United States
PATENT ASSIGNEE(S):	Amoco Corporation, Chicago, IL, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 4871037		19891003
APPLICATION INFO.:	US 1988-244766		19880915 (7)
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Bui, Thuy M.		
LEGAL REPRESENTATIVE:	Brown, Scott H., Hook, Fred E.		
NUMBER OF CLAIMS:	14		
EXEMPLARY CLAIM:	1,11		
NUMBER OF DRAWINGS:	4 Drawing Figure(s); 4 Drawing Page(s)		
LINE COUNT:	634		

AB An excavating system, such as for drilling an oil or gas well, includes a source of high pressure fluid and a drillstring through which

the fluid is conducted to an excavating apparatus connected to the bottom of the drillstring. The excavating apparatus includes a drill bit having mechanical cutting elements for mechanically boring into an earthen formation. The excavating apparatus also includes a nozzle rotatably mounted to the body of the drill bit so that the nozzle is rotatable about an axis of rotation different from the axis of rotation of the drill bit. As the drill bit is rotated about its axis of rotation, high pressure fluid is ejected from the nozzle to rotate the nozzle about its axis of rotation while the nozzle orbits the axis of rotation of the drill bit. This combined rotary and orbital motion combined with the positioning of the one or more ports of the nozzle produce a high pressure jet spray scouring substantially all the cross-sectional area engaged by the mechanical cutting elements of the drill bit as the drill bit rotates.

L4 ANSWER 7 OF 8 PATFULL  
ACCESSION NUMBER: 83:46031 USPATFULL  
TITLE: Roller cone drill bit  
INVENTOR(S): Munson, Beauford E., P.O. Box 3047, Butte, MT, United States 59702

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 4408671		19831011
APPLICATION INFO.:	US 1982-350280		19820219 (6)
RELATED APPLN. INFO.:	Continuation of Ser. No. US 1980-143340, filed on 24 Apr 1980, now abandoned		
DOCUMENT TYPE:	Utility		
FILE SEGMENT:	Granted		
PRIMARY EXAMINER:	Novosad, Stephen J.		
ASSISTANT EXAMINER:	Starinsky, Michael		
LEGAL REPRESENTATIVE:	Browne, Robert E.		
NUMBER OF CLAIMS:	7		
EXEMPLARY CLAIM:	1		
NUMBER OF DRAWINGS:	6 Drawing Figure(s); 2 Drawing Page(s)		
LINE COUNT:	252		

AB A roller bit for use with a drill string, having at least two cutters which are generally conically shaped; each cutter includes one or more teeth in inclined planes across a conical surface. The bit is attached to the drill string with the axis of rotation of the cutter angled with respect to the longitudinal axis of the drill string. The teeth on each cutter are arranged for maximum cuttings size and penetration rate.

L4 ANSWER 8 OF 8 USPAT2

ACCESSION NUMBER: 2001:175228 USPAT2  
TITLE: Steel tooth cutter element with expanded crest  
INVENTOR(S): Steinke, Stephen C., The Woodlands, TX, United States  
Portwood, Gary R., Kingwood, TX, United States  
Garcia, Gary E., The Woodlands, TX, United States  
Moran, David P., The Woodlands, TX, United States  
Nguyen, Quan V., Santa Ana, CA, United States  
PATENT ASSIGNEE(S): Smith International, Inc., Houston, TX, United States (U.S. corporation)

	NUMBER	KIND	DATE
PATENT INFORMATION:	US 6367568	B2	20020409
APPLICATION INFO.:	US 2001-858138		20010515 (9)
RELATED APPLN. INFO.:	Division of Ser. No. US 1998-146095, filed on 3 Sep 1998, now patented, Pat. No. US 6241034		

	NUMBER	DATE
PRIORITY INFORMATION:	US 1997-57915P	19970904 (60)
DOCUMENT TYPE:	Utility	
FILE SEGMENT:	GRANTED	
PRIMARY EXAMINER:	Schoeppel, Roger	
LEGAL REPRESENTATIVE:	Conley, Rose & Tayon, P.C.	
NUMBER OF CLAIMS:	8	
EXEMPLARY CLAIM:	1	
NUMBER OF DRAWINGS:	85 Drawing Figure(s); 20 Drawing Page(s)	
LINE COUNT:	820	

AB A cutter element for a drill bit. The cutter element has a base portion and an extending portion and the extending portion has either a zero draft or a negative draft with respect to the base portion. The non-positive draft allows more of the borehole bottom to be scraped using fewer cutter elements. The cutter elements having

non-positive draft can be either tungsten carbide inserts or steel teeth.